

## AMENDED CLAIMS

DT09 Rec'd PCT/PTO 10 SEP 2004

[received by the International Bureau on 16 December 2003 (16.12.03);  
new claims 41-52 added; remaining claims unchanged; (3 pages)]

35. The apparatus according to Claim 34, wherein the tracking unit (125) includes a tracking error correction unit for correcting tracking errors, the error correction unit comprising:

a position modulator (332) for modulating a position of the reading spot,  
5 an error determination unit (333) for receiving a data signal having an amplitude which varies according to respective offsets from the track in radial and axial directions, and is responsive to the data signal to determine a direction of a respective offset from the track in radial and axial directions, which offsets may be fed to the optical unit to correct radial and axial position errors of the reading  
10 spot.

36. The device according to Claim 35, wherein the reading spot is a volume of intersection of at least two light sources focused on the track.

37. The device according to Claim 35, wherein the position modulator is adapted to modulate a position of the reading spot with a cyclic function.

15 38. The device according to Claim 37, wherein the cyclic function is substantially sinusoidal.

39. The device according to any one of Claims 35 to 38, wherein the error determination unit includes:

a multiplier (340) for multiplying the data signal by a cyclic modulation  
20 signal to form a modulated data signal, and  
a low pass filter (341) for low pass filtering the modulated data signal.

40. The device according to Claim 39, wherein the low pass filter is a window integrator (341).

41. A method for correcting tracking errors in an optical storage medium  
25 having multiple tracks arranged in different layers of the optical storage medium, the method comprising:

- (a) directing a reading spot that is nominally focused on to a track in the optical storage medium,
- (b) continually moving the reading spot in axial and radial directions,
- (c) receiving a signal having an amplitude which varies according to  
5       respective offsets from the track in radial and axial directions,
- (d) using the received signal to determine a direction of a respective offset  
      from the track in radial and axial directions, and
- (e) adjusting a location of the reading spot accordingly.

42. The method according to Claim 41, wherein step (a) includes directing at  
10   least two light sources whose volume of intersection constitutes the reading spot.

43. The method according to Claim 41 or 42, wherein step (b) includes  
modulating a position of the reading spot with a cyclic function.

44. The method according to Claim 43, wherein the cyclic function is  
substantially sinusoidal.

15   45. The method according to any one of Claims 41 to 44, wherein step (c)  
includes:

- i) reading a data signal with the reading spot,
- ii) multiplying the data signal by a cyclic modulation signal to form  
a modulated data signal, and
- 20   iii) low pass filtering the modulated data signal.

46. The method according to Claim 45, wherein step (iii) includes window  
integrating the modulated data signal.

47. An error correction device for correcting tracking errors in an optical  
storage medium having multiple tracks arranged in different layers of the optical  
25   storage medium that are read by a focused reading spot directed by an optical

head to a track in the optical storage medium, the error correction device comprising:

a position modulator for modulating a position of the reading spot,

an error unit for receiving a data signal having an amplitude which varies  
5 according to respective offsets from the track in radial and axial directions, and is  
responsive to the data signal to determine a direction of a respective offset from  
the track in radial and axial directions, which offsets may be fed to the optical  
head to correct radial and axial position errors of the reading spot.

48. The device according to Claim 47, wherein the reading spot is a volume of  
10 intersection of at least two light sources focused on the track.

49. The device according to Claim 47 or 48, wherein the position modulator  
modulates a position of the reading spot with a cyclic function.

50. The device according to Claim 49, wherein the cyclic function is  
substantially sinusoidal.

15 51. The device according to any one of Claims 47 to 50, wherein the error unit  
includes:

a multiplier for multiplying the data signal by a cyclic modulation signal to  
form a modulated data signal, and

a low pass filter for low pass filtering the modulated data signal.

20 52. The device according to Claim 51, wherein the low pass filter is a window  
integrator.